

Thunder-storms were also reported from the following stations not included in the districts named above:

- 4th.—Roseburg and Albany, Oregon.
5th.—Roseburg, Oregon, Fort Lapwai, Idaho, and Salt Lake City, Utah.
6th.—Salt Lake City, Utah.
10th.—Fort Totten, Dakota, and Nephi, Utah.
12th.—Fort Buford, Dakota.
18th.—Los Angeles, Poway, and San Diego, California.
19th.—Poway, California.
21st.—Carson City, Nevada.
30th.—Nephi, Utah.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various districts on the following dates:

New England.—6th, 10th, 11th, 12th, 15th, 17th, 19th to 22d, 24th, 28th.

Middle Atlantic states.—5th, 6th, 8th, 10th, 11th, 14th, 16th, 18th to 21st, 28th.

South Atlantic states.—11th, 15th, 18th, 21st, 28th.

Western Gulf.—5th, 6th, 7th, 9th, 14th, 15th, 19th, 20th, 27th, 28th.

Tennessee.—7th, 8th, 13th, 16th, 28th.

Lower lakes.—12th, 16th, 19th, 20th, 28th.

Middle Slope.—9th, 15th, 27th, 28th, 29th.

Solar halos were also observed at the following stations not included in the districts named above:

California.—San Francisco, 10th, 21st, 24th, 27th to 30th.

Florida.—Key West, 25th, 27th; Pensacola, 12th, 24th.

Idaho.—Fort Lapwai, 14th.

Illinois.—Anna, 28th; Cairo, 4th; Riley, 6th, 19th.

Indiana.—Vevay, 29th; Wabash, 5th.

Iowa.—Keokuk, 7th.

Kansas.—Fort Scott, 27th.

Michigan.—Alpena, 29th; Grand Haven, 27th.

Minnesota.—Saint Vincent, 24th.

Mississippi.—Vicksburg, 19th.

Ohio.—Columbus, 12th.

Texas.—Fort Stockton, 18th.

Utah.—Nephi, 16th; Salt Lake City, 11th, 24th.

Washington Territory.—Dayton, 8th; Fort Canby, 16th.

LUNAR HALOS.

Lunar halos have been observed in the various districts on the following dates:

New England.—10th to 14th, 16th, 19th, 20th, 22d.

Middle Atlantic states.—9th to 14th, 16th to 22d.

South Atlantic states.—10th, 12th, 14th, 17th, 18th, 19th.

Eastern Gulf.—8th, 12th, 15th, 16th, 19th.

Western Gulf.—9th to 20th.

Tennessee.—10th, 12th, 14th, 16th, 19th.

Ohio valley.—10th, 12th, 13th, 16th.

Lower lakes.—11th to 14th, 17th to 20th.

Upper lakes.—11th to 17th, 19th.

Upper Mississippi valley.—7th, 14th, 15th.

Missouri valley.—9th, 10th, 12th, 13th, 14th, 19th.

Lunar halos were also observed at the following stations, not included in the districts named above:

Arizona.—Prescott, 10th.

California.—San Francisco, 15th.

Colorado.—West Las Animas, 9th.

Dakota.—Bismarek, 17th; Fort Totten, 28th.

Florida.—Sanford, 14th, 15th.

Kansas.—Salina, 14th; Yates Centre, 9th.

Nebraska.—North Platte, 14th.

Ohio.—Columbus, 18th.

Oregon.—Albany, 15th.

Pennsylvania.—Pittsburg, 11th.

Texas.—Brownsville, 17th; Fort Concho, 17th; Fort Stockton, 11th.

Utah.—Nephi, 16th.

Washington Territory.—Fort Canby, 10th.

MIRAGE.

Block Island, Rhode Island, 26th.—The main land at Point Judith was visible to-day from 7 a. m. to 4.30 p. m.

Salina, Kansas, 19th, 24th, 28th.

Indianola, Texas, 16th, 23d, 24th.

MISCELLANEOUS PHENOMENA.

SUNSETS.

The characteristics of the sky, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from one hundred and forty-one stations show 4,203 observations to have been made, of which three were reported doubtful; of the remainder, 4,200, there were 3,660, or 87.2 per cent., followed by the expected weather.

SUN SPOTS.

The following record of sun spots for the month of September, 1883, has been forwarded by Professor D. P. Todd, Director of the Lawrence observatory, Amherst, Massachusetts:

Date— Sept., 1883.	No. of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 8 a. m.	1	20†	0	10†	1	3	7	95†	
2, 9 a. m.	1	10†	2	5	1	5	6	80†	
3, 10 a. m.	1	3	0	10†	1	1	7	55†	
4, 10 a. m.	1	1	1	5	1	1	7	40†	
5, 9 p. m.	0	0	1	4	0	0	5	30†	
6, 5 p. m.	0	0	0	5	0	0	5	20†	
9, 10 a. m.	1	6			1	6	0	20†	One of the spots very large.
10, 4 p. m.	2	13†		2	1	3	6	30†	Do.
11, 4 p. m.	0	10†	1	3	0	2	5	35†	Do.
15, 12 m.	3	15†					6	50†	
16, 10 a. m.	0	0		3	0	0	5	45†	
18, 5 p. m.	0	0			0	0	5	25†	Broad areas of facule.
19, 11 a. m.	0	0	0	5	0	0	4	20†	
21, 4 p. m.	0	0	2	10†	0	0	2	10†	Veiled spots.
22, 11 a. m.	1	3	0	3	0	0	2	10†	Do.
25, 3 p. m.	0	0			0	0	0	0	
26, 11 a. m.	3	8	0	0	1	2	3	8	Do.
27, 3 p. m.	0	0	0	0	0	0	2	6	Do.

Facule were seen at the time of every observation. † Approximated.

Mr. William Dawson, of Spiceland, Indiana, reports having observed sun spots during September, as follows:

1st.—Seven groups, ninety spots; one group of six prominent spots, three of which were quite large, appeared in the southeast quadrant.

3d.—Eight groups, sixty-six spots; one spot 9,000 miles long and 6,500 miles wide was faintly visible to the naked eye.

5th.—Six groups, sixty spots; the large spot observed on the 3d appeared much broken.

10th.—Five groups, fifty spots; one of which was visible to the naked eye.

13th.—The large spot seen on the 10th was still plainly visible without the telescope.

14th.—Six groups, eighty spots; the large spot before mentioned was much broken on this date, but it was still visible to the naked eye.

19th.—Four groups, forty spots.

21st.—Two groups, seventeen spots, fourteen of which were near the western edge.

24th.—Three groups, seven small spots.

26th.—Two groups, seven spots; one large spot at east edge.

28th.—Four groups, seventeen spots.

29th.—Five groups, twenty-two spots, all of which, with one exception, were very small.

Mr. H. D. Goway, at North Lewisburg, Ohio, reports that sun spots were observed at that place on all clear days during the month.

The s. s. "Hevelius," on the 10th and 11th, at Bahia, Brazil, and from the 12th in S. 11° 00', W. 35° 30', to the 21st, in N. 27° 07', W. 21° 30'; observed daily a large spot on the sun, which disappeared on the last-named date.

The s. s. "Llandaff City" observed sun spots, as follows:

on the 1st in N. 40° 18', W. 70° 20'; observed one spot. 3d: in N. 40° 30', W. 63° 30'; observed three spots. 5th: in N. 41° 40', W. 54° 15'; observed four spots. 8th: in N. 45° 48', W. 41° 21'; observed three spots. 10th: in N. 48° 17', W. 31° 35'; observed one spot. 11th: in N. 50° 12', W. 26° 13'; observed a large spot on the sun at sunset.

METEORS.

Augusta, Georgia.—At 7.27 p. m., of the 4th, a large meteor appeared in the northern sky at an elevation of about 45° and fell to the horizon.

Highlands, North Carolina.—A brilliant meteor, (probably the same as reported from Augusta) was seen here between 7 and 8 p. m., of the 4th; it passed in a southwesterly direction, and exploded when near the horizon.

Sanford, Florida, 7th.—At 10.25 p. m. a bright meteor shot across the sky from the northwest, and disappeared beneath the southern horizon. It was apparently from six to eight inches in diameter, and resembled a ball of fire.

Block Island, Rhode Island, 22d.—A small meteor shot across the northwestern sky at 8 p. m., and broke into two parts before disappearing.

Bangor, Maine, 27th.—A brilliant meteor was seen in the eastern sky at 11 p. m., of the 28th, lighting up the sky like a flash of lightning.

San Francisco, California.—A brilliant meteor was observed here at 11.55 p. m., of the 28th. It passed from the zenith in a southwesterly direction, apparently going into the bay. As it approached the earth it increased in size and brightness, leaving behind it a trail similar to that of a rocket.

Meteors were also observed at the following places during the month:

- 2d.—Variety Mills, Virginia.
- 3d.—Woodstock, Maryland.
- 4th.—Clay Centre, Kansas; Woodstock, Maryland.
- 5th.—Variety Mills, Virginia; Woodstock, Maryland.
- 7th.—Woodstock, Maryland.
- 8th.—Leetsdale, Pennsylvania.
- 14th.—Ames, Iowa.
- 17th.—Lead Hill, Arkansas.
- 19th.—Salina, Kansas; Fallsington, Pennsylvania.
- 20th.—Woodstock, Maryland.
- 24th.—Woodstock, Maryland; Marion, Virginia.
- 25th.—Salina, Kansas.
- 26th.—Woodstock, Maryland; Princeton, Massachusetts;
- Brevard, North Carolina; Ames, Iowa.
- 27th.—Woodstock, Maryland.
- 28th.—Yuma, Arizona; San Francisco, California.
- 30th.—Woodstock, Maryland.

EARTHQUAKES.

Los Angeles, California.—On the morning of September 1st two light shocks of earthquake were felt at this place. The first shock was felt at 8.25 a. m., the vibration being from north to south; the second shock succeeded the first after an interval of about four seconds. At 4.20 a. m., of the 5th, another heavy earthquake shock occurred. The vibrations were from northeast to southwest, and were sufficient to displace light articles of furniture and to cause chandeliers to sway with considerable motion.

The following extract is taken from "Nature," of September 6th, 1883:

A sharp shock of earthquake was felt at 8 o'clock on September 2d at Frascati, on the Alban hills, twelve miles from Rome, Italy. The movement was undulatory and lasted several seconds, but without causing any damage. The instruments in the observatory of the Roman college at the same time showed a sensible undulatory movement in the direction of from northeast to southwest. The earthquake was felt simultaneously at Albano, Ariccia, Genzano, Roccati, Papa, Monte Porzio, and at other towns on the Alban hills.

Berlin, Germany, September 6th.—There were several shocks of earthquake at Dusseldorf on the night of the 4-5th. Shocks were also felt on the island of Ischia at the same time, which created some alarm, but caused no damage.

Santa Barbara, California, 5th.—At 4.15 a. m., of this date, an earthquake shock of fifteen seconds' duration was felt here; vibration from north to south. Another shock, lasting five seconds, occurred at 2.30 p. m., of the 13th.

San Francisco, California, 5th.—Reports from Wilmington and Los Angeles, in this state, announce that sharp shocks of earthquake were felt at those places at 4.30 a. m., of this date. The vibrations were from northwest to southwest.

Lima, Peru, September 8th.—Prolonged shocks of earthquake were felt at this place at 11 p. m., of September 6th. At 4.10 a. m., of the 10th, an unusually strong shock of earthquake was felt here. Its duration was fifteen seconds, and the direction of vibration was from south to north.

London, England.—Earthquake shocks were felt at Casamicciola, on the island of Ischia, during September 9th and 10th.

Greensborough, Guilford county, North Carolina.—An earthquake shock was felt at this place on the morning of the 21st. At 6.45 o'clock a heavy rumbling noise was heard, which was instantly followed by a severe shake of the earth, lasting about one minute. The shock was most severe in the western part of the town. The houses shook as if there had been an explosion near by. Some alarm was caused, but no damage was done.

Naples, Italy, September 23d.—Two severe shocks of earthquake were felt at Casamicciola on this date. One house was wrecked, but no lives were lost.

Portland, Oregon.—Two light shocks of earthquake were felt here at about midnight of 28-29th. They were not violent, but were sufficient to cause a slight movement of lamps, furniture, &c.

London, England, September 26th.—Advices from Colombo, Ceylon, state that the recent earthquake in Java caused a sudden subsidence of the sea, at Colombo, of fifteen feet. On August 27th the water rose and fell violently for half an hour, at the end of which time it resumed its normal condition. Several vessels broke from their moorings, but no other damage was reported. (See page 192 of the August REVIEW for account of similar phenomenon, observed at San Francisco, California.)

DROUGHT.

Owing to the small monthly rainfall of September and the deficiencies of the preceding months, July and August, the drought which began in those months has continued unbroken in many sections of the country during September. The following figures show the departures from the average rainfall in the southern states for July, August, and September, 1883, as compiled from the Signal Service records:

Districts.	July.	August.	September.	Total.
Tennessee.....	-0.99	-0.41	-1.19	-2.59
South Atlantic.....	-0.73	-0.72	+0.69	-0.76
Eastern Gulf.....	-2.54	-1.94	-3.93	-8.41
Western Gulf.....	-1.72	-2.65	-1.16	-5.53

The following notes relating to the drought of September, 1883, have been collected from the various states:

Alabama.—Montgomery, 28th: reports from surrounding localities state that wells are drying up, and in some sections water for stock is hauled long distances. Crops are suffering for rain.

Arkansas.—Little Rock, 11th: the cotton and wheat crops are suffering from the effects of drought in this part of the state.

Fort Smith, 15th: the rain of this date ended the drought which prevailed in this locality. It is considered that the cotton crop has been damaged to the extent of from 25 to 50 per cent.

Georgia.—Atlanta: the following extract is taken from the September report of the commissioner of agriculture for this state: "The growing season, now drawing to a close, has been remarkable in this, that there has been no general rain, reaching over the entire state, since April 23d. In different sections of the state and at different times, the prevailing drought has

broken once or twice, but in some localities there has not been a good season since the date just mentioned. It is well said by one of the correspondents that the year has been one of a succession of long droughts and intensely hot spells. Even when rains have fallen they have not, as a rule, been followed up or repeated at short intervals, and, consequently, have only saved the leading crops from total failure."

Florida.—Pensacola, 23d: owing to the prolonged drought the fields in this vicinity are thoroughly parched, and vegetation completely dried up.

Illinois.—Edgington, Rock Island county, 30th: but little rain has fallen here since July 20th. The ground is very dry and vegetation is suffering.

Indiana.—Vevay, Switzerland county: from the 1st to 20th, vegetables suffered from lack of rain; the pastures became dry and parched, and the sowing of wheat has been delayed. The precipitation during the first nineteen days was only .27 inch, but from the 20th to the 30th more than 4.00 inches fell, which proved of great benefit to the suffering vegetation.

Salem, Washington county, 30th: drought has prevailed in this locality during the month, and the seeding of the wheat crop has been delayed in consequence.

Kansas.—Yates Centre, Woodson county, 30th: wells and springs in this part of the state are drying up, and streams are very low.

Independence, Montgomery county, 30th: the past month has been the driest September recorded at this place. Rain-fall for the month is .88 inch. Wells and streams are drying up.

Louisiana.—Grand Coteau, Saint Landry parish, 30th: owing to the prolonged drought, cisterns are becoming exhausted, and cattle on the prairies are suffering for water. Only about one-third of the average yield of corn and cotton will be produced.

Maine.—Bangor, 30th: the drought which prevails throughout New England is especially severe in the Penobscot valley. Wells, springs and streams have become dry. Farmers are compelled to drive their stock long distances for water, and in Bangor teams are employed for hauling water to houses in the outskirts of the city. The grass in pastures has dried up and become worthless for grazing. Many saw mills were shut down during the early part of the month, and others have been compelled to partially suspend work.

Massachusetts.—Boston, 7th: the severe drought which prevails throughout New England has seriously damaged the crops and dried up streams and wells.

Wareham, Plymouth county, 10th: the drought of the past six or eight weeks has been the severest experienced here for a number of years. On many farms vegetation has been so dried that copious rains would not restore it. Pasturage throughout the Cape Cod district is very poor, and the recent rains have proved of little benefit.

Mendon, Worcester county, 30th: scarcity of water exists in this part of the state. Many wells have become dry and water for household purposes is hauled long distances.

Missouri.—Lawrence county, 30th: September was a remarkably dry month in this part of Missouri. The monthly rain was only 0.20 inch.

New Hampshire.—Dover, Strafford county, 22d: great scarcity of water exists at this place, and the mills in the surrounding country are shut down in consequence. Wells and streams are dried up, and cattle are driven long distances for water.

Bristol, Grafton county, 30th: During September the water in New Found lake fell sixteen inches, which is the greatest fall for one month that has been noted for several years.

Manchester, Hillsborough county, October 1st: the recent heavy rains have given sufficient water-power to all the mills in this city which have been idle some weeks, enabling them to resume work on this date.

Tennessee.—Nashville: the following extract is taken from the September report of the Commissioner of Agriculture for Tennessee: * * * "The drought which began early in August has

continued throughout September, and has been general. In some localities, notably in the Eastern Division, it has been almost unprecedented in its severity. Late corn and other unmaturing crops have been cut short, and, in many instances, stock has suffered on account of pastures drying up. In the Middle Division the drought has not been so severe, and crops generally are in a fair condition. In the Western Division crops have suffered greatly, more especially cotton, which has been materially reduced in all of the cotton-growing counties, by drought and rust combined. * * * Plowing for seeding wheat and other grains has been greatly retarded in all parts of the state on account of the dryness and hardness of the soil, and planting will necessarily be late."

Virginia.—Petersburg, 11th: the protracted drought, which has done great damage to the crops throughout Virginia, was ended by the heavy rain of this date. In consequence of the drought the streams were almost completely dry, and the water in the city reservoir had become so low that the city was threatened with a water famine.

PRAIRIE AND FOREST FIRES.

Philadelphia, Pennsylvania, 6th.—Serious forest fires are reported from the lower parts of Camden and Atlantic counties, New Jersey. Much damage has been done to the timber lands.

Boston, Massachusetts, 7th.—Forest fires have been burning for several weeks in some of the outlying towns near this city.

From the south shore stretching around to the west, and reaching eastward to Massachusetts bay, numerous fires have been beyond control, and the country for miles around presents a blackened and desolate appearance. The extensive fires which have raged on the south shore branch of the Old Colony railroad have burned over thousands of acres. In many instances it was necessary to call out the fire departments in Quincy, Braintree, Weymouth, Higham, and Cohasset, and much valuable property was saved through their exertions. In many cases the scarcity of water from the extreme drought made it very difficult to extinguish the fires.

New York City, 7th.—For several miles on both sides of the railroad track, between Long Island City and Sag Harbor, much timber land has been burned over. On Hemstead plains to the eastward of Garden City, the fires burned the grass and brush off thousands of acres of land. The meadows in the Hackensack valley, north of Smoke Hill, burned for several days, but no damage to property occurred. About one acre of woodland near Peekskill, Westchester county, was burned.

Milton, Massachusetts, 10th.—Nearly one thousand acres of the Blue Hills have been burned over during the past week, and much damage has been done to standing wood.

Dover, Strafford county, New Hampshire.—The belt of woods near the Great Falls was burning on the 22d.

Saint John's, New Brunswick, 22d.—The forest fires now burning have caused great damage in this province.

Mount Washington, New Hampshire.—The adjacent valleys were filled with dense smoke from forest fires on the 21st, 22d, and 24th.

Bangor, Maine, 30th.—During the protracted dry weather great care has been exercised to prevent the breaking out of forest fires in this state. Although forest fires have been less numerous than during former dry seasons, where they have originated, they have continued until the close of the month. Mount Desert island has suffered seriously in consequence of forest fires.

Yankton, Dakota.—Prairie fires occurred in this vicinity on the 4th and 24th. On the latter date about 1,000 tons of hay were burned near Freeport.

Nephi, Juab county, Utah.—Fires burned on Nebo mountain from the 23d to the end of the month.

Cœur d'Alene, Idaho.—Dense smoke from forest fires prevailed in this locality on the 3d, 24th, 26th, 29th, and 30th.

Fort Canby, Washington Territory, 1st.—Extensive forest fires are burning in this territory and in Oregon. Large

quantities of timber have been destroyed, and the atmosphere filled with dense smoke. These fires have been burning for the last three months.

Poway, San Diego county, California.—Brush fires prevailed in this vicinity from the 21st to the 24th.

Less extensive prairie and forest fires have occurred during the month as follows:

Dayton, Washington Territory.—1st, 22d, 23d, 28th.

Fort Maginnis, Montana.—6th, 23d to 26th.

Los Angeles, California.—24th, 25th.

Deadwood, Dakota.—26th.

Fort Totten, Dakota.—26th.

Fort Smith, Arkansas.—27th.

Fort Bennett, Dakota.—29th.

POLAR BANDS.

Lead Hill, Arkansas, 1st, 6th, 10th, 11th, 13th, 25th, 26th.

Alexandria, Dakota, 16th, 24th.

Archer, Florida, 14th, 17th, 21st, 23d, 25th, 27th, 29th.

Riley, Illinois, 27th.

Wabash, Indiana, 10th.

Yates Centre, Kansas, 9th.

Salina, Kansas, 18th, 23d.

Gardiner, Maine, 11th, 13th, 28th.

Freehold, New Jersey, 10th.

Vineland, New Jersey, 8th, 14th, 17th, 20th.

Portsmouth, North Carolina, 7th, 15th.

Wauseon, Ohio, 28th.

Nashville, Tennessee, 12th, 13th.

Palestine, Texas, 18th, 23d, 24th.

Woodstock, Vermont, 4th, 20th.

The following extract is taken from a communication from Dr. James C. Neal, of Archer, Florida:

I see in Florida, almost constantly, that if polar bands occur in the upper strata, the surface wind blows at a right angle to the bands, i. e., if the axis of the polar bands lies north and south, the wind is east to west or west to east, and in ten or fifteen hours thereafter, the surface wind coincides with the axis of the polar band. If the upper strata of clouds move at a right angle to the lower, in from eight to twelve hours afterward, the surface wind changes to the direction of the upper clouds.

MIGRATION OF BIRDS.

Geese flying southward.—Sacramento, California, 1st; Keokuk, Iowa, 4th; Wauseon, Ohio, 8th; Indianola, Texas, 19th, 21st; Alexandria, Dakota, 20th, 22d; Narragansett Pier, Rhode Island, 22d; Wentworth, Dakota, 26th, 28th; Traverse City, Michigan, 29th; Morriston, Dakota, 29th; Ithaca, New York, 30th.

Flying northward.—Marquette, Nebraska, 24th.

Ducks flying southward.—Red Bluff, California, 14th.

Flying northward.—Des Moines, Iowa, 25th.

WATER-SPOUTS.

Captain H. S. Quick, of the s. s. "New York," reported on the afternoon of September 8th, near N. 31° 45', W. 80°: "Two water-spouts formed near the ship and were very near together—had to haul the ship northeast to clear them. They travelled from east to west."

Captain Salter, of the ship "Marlborough," reported on September 14th, in latitude 43° 32' N., longitude 38° W.: "Passed between two water-spouts, which were within a stone's throw of the vessel."

ZODIACAL LIGHT.

Pensacola, Florida, 20th.

Cambridge, Massachusetts, 11th.

Nashville, Tennessee, 1st, 2d, 4th, 6th, 7th, 8th, 10th to 15th.

Palestine, Texas, 21st, 22d, 24th, 25th.

SAND STORMS.

Yuma, Arizona, 9th, 21st, 30th.

Fort Garland, Colorado, 5th.

Huron, Dakota, 20th.

San Carlos, Arizona, 18th, 21st, 22d.

NOTES AND EXTRACTS.

The following meteorological summary has been forwarded by Mr. W. H. Ragan, Lafayette, Indiana, Director of the "Weather Service" of that state:

September, 1882, was chiefly noted for its low mean temperature. The records of this office show the monthly mean temperature of September, 1880, to have been 63° 89; of September, 1881, 70° 82; of September, 1882, 63° 01; and of September, 1883, 61° 22. This is 3° 53 below the average for the four years named, and 4° 71 lower than the average of the three years immediately preceding.

The average September rainfall for the years named is 2.10 inches, while that of September, 1883, is 1.64.

Frosts occurred on the 6th, 10th, and 26th; that of the 10th greatly damaged the late corn and other tender vegetation.

The highest barometer, 30.51, occurred on the 9th; the lowest, 29.74, on the 24th.

The highest temperature, 87°, occurred on the 15th; the lowest, 32°, occurred on the 26th.

The prevailing wind for the month was from the northeast, thirty-five observations out of the ninety showing the wind from this source.

From the reports of thirty-one local observers reporting to this office, the following summary is made:

Average maximum barometer, 29.95; average minimum barometer, 29.29; average mean barometer, 29.78; maximum barometer, 30.51, is reported from Tippecanoe county; minimum barometer, 28.66, is reported from Henry county; highest mean barometer, 30.47, from Tippecanoe county; lowest mean barometer, 28.96, from Henry county; greatest daily range of barometer, 0.90, from Hamilton county; least daily range, 0.09, from Switzerland county.

Average maximum temperature, 87° 12; average minimum temperature, 42° 06; average mean temperature, 63° 58; maximum temperature, 93°, reported from Spencer county; minimum temperature, 32°, from Tippecanoe county; maximum monthly range of temperature, 58°, reported from Vermillion county; minimum monthly range, 36°, from Hamilton county.

Greatest number of clear days, eighteen for Washington county; least number, one, for Putnam county; greatest number of rainy days, eleven, for Fayette county; least number, two each for Dubois and Washington counties.

Nineteen observers report the maximum temperature for the 15th, and twelve for the 2d. Twenty-six reported the minimum temperature on the 26th; one on the 18th; one on the 27th; one on the 10th; and two failed to report.

Greatest rainfall reported, 5.98 inches for Randolph county; smallest rainfall, 0.15 inches for Gibson county; average rainfall, 1.99 inches.

REPORT OF THE MISSOURI WEATHER SERVICE FOR SEPTEMBER, 1883.

The mean temperature for September has been very near the average, 69.0 degrees, and has been quite uniform and pleasant. The rainfall in and around St. Louis has been less than one-hundredth of an inch for the entire month. This has not happened before, since Engelmann began his series in 1839, although in 1871 the September rainfall was only 0.02 of an inch. Other small rainfalls have been, 1867, 0.17 inch; 1844, 0.30, and 1875, 0.33. The normal rainfall at Saint Louis is three inches. The highest September rainfall was observed in 1866, and was 10.53 inches.

Other stations reporting no rain for the past month were Saint Charles and Greenfield. In Mascoutah, Illinois, the fall was 0.03 inch. South of a line running through Clinton and Harrisonville, and passing south of Kirksville and Hannibal, the rainfall was less than an inch. The highest rainfall reported was 2.00 inches, at Pleasant Hill, and 2.15 at Oregon. The lowest temperatures reported are: Boonville, 32° 0 on the 23d; Centreville, 34° 0 on the 9th, Corning, 38° 0. The highest temperature reported was 96° 0 at Harrisonville, 94° 9 at Glasgow, 93° 0 at Warrenton and Mascoutah. Light hoar frosts, the first of the season, occurred at Macon on the 8th, and at Shelbyville, Warrenton, Mexico, Macon, Louisiana, Kirksville, Greenfield, and Corning on the morning of the 9th. Later frosts were Saint Charles, Louisiana, Mexico, Ironton, Kirksville on the 10th, Greenfield on the 18th and 23d, Carthage on the 23d, and Macon, Ironton, Corning on the 26th.

The corn crop has not been materially injured by frost except over limited areas on low ground, but it has suffered somewhat for lack of rain, which prevented the ears from filling out properly.

FRANCIS E. NIPHER, Director.

WASHINGTON UNIVERSITY, October 8, 1883.

WEATHER REPORT FOR SEPTEMBER, 1883.

[Prepared by Prof. F. H. Snow, of the University of Kansas, from observations taken at Lawrence.]

This month was remarkable for having a smaller rainfall, and, with one exception (1868), a lower mean temperature than any other September on our sixteen years' record. Notwithstanding the low mean temperature, the minimum temperature was 13.5 degrees above freezing point, and there was not even the lightest touch of hoar frost.

Mean temperature 63.52°, which is 2.82° below the September average. The highest temperature was 91° on the 1st; the lowest was 45.5° on the 9th, giving a range of 45.5°. The mercury reached 90° only once. Mean temperature at 7 a. m., 57.33°; at 2 p. m., 74.65°; at 9 p. m., 61.05°.

Rainfall 1.25 inches, which is 1.95 inches below the September average.